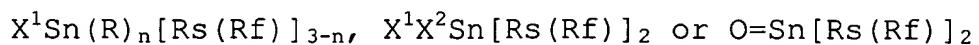


WHAT IS CLAIMED IS:

1. A method of carrying out a reaction comprising the steps of:

mixing at least one organic reaction component with a fluorous reaction component having the formula:



wherein n is 1 or 2, R is a C₁-C₆ alkyl group, X¹ and X² are independently, the same or different, H, F, Cl, Br, I, N₃, OR¹, OOR¹, SR¹, SeR¹, CN, NC, NR¹R², an aryl group, a heteroaryl group, an alkyl group of 1 to 20 carbons, an alkenyl group, an alkynyl group, -C(O)R³, M((Rs')(Rf'))₃, OM((Rs')(Rf'))₃ or OOM((Rs')Rf'))₃, wherein M is Si, Ge, or Sn, and wherein R¹ and R² are each independently the same or different H, an alkyl group, -SO₂R³ or -C(O)R³, wherein R³ is an alkyl group or an aryl group, and wherein Rs and Rs' are each independently the same or different a spacer group, and wherein Rf and Rf' are each independently the same or different a fluorous group;

carrying out a reaction to produce an organic product; and

after producing the organic product, separating any excess of the fluorous reaction component and any fluorous byproduct of the fluorous reaction component using a fluorous separation technique.

2. The method of Claim 1 wherein X^1 and X^2 are independently the same or different an allyl group, Br, Cl, F, I, or H, Rs is $-\text{CH}_2\text{CH}_2-$, and Rf is a perfluoroalkyl group.

3. The method of Claim 1 wherein Rf is a fluorohydrocarbon group, a perfluorocarbon group, a fluorinated ether group or a fluorinated amine group.

4. The method of Claim 1 wherein Rf is a linear perfluoroalkyl group of 3 to 20 carbons, a branched perfluoroalkyl group of 3 to 20 carbons, and a hydrofluoroalkyl group of 3 to 20 carbons, the hydrofluoroalkyl group comprising up to one hydrogen atom for each two fluorine atoms.

5. The method of Claim 1 wherein Rf is a linear perfluoroalkyl group of 6 to 12 carbons, a branched perfluoroalkyl group of 6 to 12 carbons, or a hydrofluoroalkyl group of 6 to 12 carbons, the hydrofluoroalkyl group comprising up to one hydrogen atom for each two fluorine atoms.

6. The method of Claim 1 wherein R^3 is a perfluoroalkyl group.

7. The method of Claim 1 wherein Rs is an alkylene group or a phenylene group.

8. The method of Claim 1 wherein Rs is an alkylene group.

9. A method for carrying out a chemical reaction, comprising the steps of:

combining at least one fluorous reaction component having the formula:



wherein n is 1 or 2, R is a C₁-C₆ alkyl group, X¹ and X² are independently, the same or different, H, F, Cl, Br, I, N₃, OR¹, OOR¹, SR¹, SeR¹, CN, NC, NR¹R², an aryl group, a heteroaryl group, an alkyl group of 1 to 20 carbons, an alkenyl group, an alkynyl group, -C(O)R³, M((Rs')(Rf'))₃, OM((Rs')(Rf'))₃ or OOM((Rs')Rf'))₃, wherein M is Si, Ge, or Sn, and wherein R¹ and R² are each independently the same or different H, an alkyl group, -SO₂R³ or -C(O)R³, wherein R³ is an alkyl group or an aryl group, and wherein Rs and Rs' are each independently the same or different a spacer group, and wherein Rf and Rf' are each independently the same or different a fluorous group, and at least one organic reaction component convertible in the presence of the fluorous reaction component to a product in an organic solvent;

contacting the fluorous reaction component and the organic reaction component in the organic solvent under conditions suitable to produce the product; and

after production of the product, separating any excess of the fluorous reaction component and any fluorous byproduct of the fluorous reaction component using a fluorous separation technique.

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 10. A chemical compound having the formula:



wherein n is 1 or 2, R is a C₁-C₆ alkyl group, X¹ is H, F, Cl, Br, I, N₃, OR¹, OOR¹, SR¹, SeR¹, CN, NC, NR¹R², an aryl group, a heteroaryl group, an alkyl group of 1 to 20 carbons, an alkenyl group, an alkynyl group, -C(O)R³, M((Rs')(Rf'))₃, OM((Rs')(Rf'))₃ or OOM((Rs')Rf'))₃, wherein M is Si, Ge, or Sn, and wherein R¹ and R² are each independently the same or different H, an alkyl group, -SO₂R³ or -C(O)R³, wherein R³ is an alkyl group or an aryl group, and wherein Rs and Rs' are each independently the same or different an alkylene group of 1 to 6 carbons or a phenylene group, and wherein Rf and Rf' are each independently a fluorohydrocarbon group, a perfluorocarbon group, a fluorinated ether group or a fluorinated amine group.

11. The compound of Claim 10 wherein X¹ is an allyl group, Br, Cl, F, I, or H, Rs is -CH₂CH₂-, and Rf is a perfluoroalkyl group.

12. The compound of Claim 10 wherein Rf is a fluorohydrocarbon group, a perfluorocarbon group, a fluorinated ether group or a fluorinated amine group.

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 13. The compound of Claim 10 wherein Rf is a linear perfluoroalkyl group of 3 to 20 carbons, a branched perfluoroalkyl group of 3 to 20 carbons, and a hydrofluoroalkyl group of 3 to 20 carbons, the

hydrofluoroalkyl group comprising up to one hydrogen atom for each two fluorine atoms.

14. The compound of Claim 10 wherein Rf is a linear perfluoroalkyl group of 6 to 12 carbons, a branched perfluoroalkyl group of 6 to 12 carbons, or a hydrofluoroalkyl group of 6 to 12 carbons, the hydrofluoroalkyl group comprising up to one hydrogen atom for each two fluorine atoms.

15. ~~The compound of Claim 10 wherein R³ is a perfluoroalkyl group.~~

16. The compound of Claim 10 wherein Rs is an alkylene group of 1 to 6 carbons.

17. A chemical compound having the formula:



wherein Rs is an alkylene group of 1 to 6 carbons or a phenylene group and wherein Rf is a fluorohydrocarbon group, a perfluorocarbon group, a fluorinated ether group or a fluorinated amine group.

18. The compound of Claim 17 wherein Rs is an alkylene group of 1 to 6 carbons.

19. A chemical compound having the formula:



wherein X^1 and X^2 are independently, the same or different, H, N_3 , OR^1 , OOR^1 , SR^1 , SeR^1 , CN, NC, NR^1R^2 , a heteroaryl group, an alkyl group of 2 to 20 carbons, an alkenyl group, an alkynyl group, $-C(O)R^3$, $M((Rs')(Rf'))_3$, $OM((Rs')(Rf'))_3$ or $OOM((Rs')(Rf'))_3$, wherein M is Si, Ge, or Sn, and wherein R^1 and R^2 are each independently the same or different H, an alkyl group, $-SO_2R^3$ or $-C(O)R^3$, wherein R^3 is an alkyl group or an aryl group, wherein Rs and Rs' are each independently the same or different an alkylene group of 1 to 6 carbons or a phenylene group, and wherein Rf and Rf' are each independently a fluorohydrocarbon group, a perfluorocarbon group, a fluorinated ether group or a fluorinated amine group.

20. The compound of Claim 19 wherein Rs is an alkylene group of 1 to 6 carbons.

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